

**REVISED
ENVIRONMENTAL AUDIT PLAN
THE KNAPHEIDE MFG. CO.
WEST QUINCY, MISSOURI**

July 2, 1993

Prepared by:

**McLaren/Hart Environmental Engineering Corporation
The Hammons Tower
901 St. Louis Street
Springfield, Missouri 65806**



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1.0 INTRODUCTION

This Environmental Audit Plan (Plan) has been prepared in response to the Consolidated Consent Agreement and Consent Order, Docket Number VII-92-H-0008 and VII-93-T-499-E between EPA Region VII and The Knapheide Mfg. Co. (KNAPHEIDE).

The order requires, within 60 days of the effective date of the order (March 10, 1993), the Respondent, KNAPHEIDE, to submit the Plan to EPA for approval.

The order stipulates that the Plan shall be designed to identify the current regulatory compliance status of the West Quincy, Missouri facility, solid waste management units and environmental improvements that may be made. Further the order stipulates that the Plan shall comply with EPA's Environmental Auditing Policy Statement (51 Fed. Reg. 25004, July 9, 1986), and the National Enforcement Investigations Center Multi-media Investigations Manual dated March 1992.

Finally the order requires that the Plan shall be completed by an independent third party with no affiliation or financial interest in the Respondent or any parent, subsidiary or affiliate thereof.

2.0 QUALIFICATIONS OF RESPONDENT'S CONSULTANT

The Respondent has contracted with McLaren/Hart Environmental Engineering Corporation to conduct the environmental audit. McLaren/Hart has no affiliation or financial interest in the Respondent. McLaren/Hart was selected to conduct the audit because it has national expertise and qualifications in environmental compliance management and auditing. The audit will be managed out of McLaren/Hart's Springfield, Missouri office.

McLaren/Hart is a 100 million dollar environmental consulting firm with about 650 people located in 15 offices throughout the United States. The firm is a wholly owned subsidiary of Sandoz Corporation, an international firm with over \$10 billion in sales worldwide. Being a part of Sandoz affords McLaren/Hart significant financial strengths, insurance coverage, and technical and management support.

Environmental auditing and regulatory compliance related work makes up 25 per cent of the firm's business. McLaren/Hart has capabilities and a national reputation as one of the leading environmental auditing firms in the country.

A summary of the firm's qualifications and experience is presented below.

- The environmental auditing practice at McLaren/Hart is led by two nationally recognized experts and co-authors of *Environmental Audits*, a widely referenced text in the field, originally published in 1983 and now in the 6th edition. One of those individuals, Ray Kane, will be the overall Project Director on this assignment.
- McLaren/Hart has conducted over 500 environmental, safety and health compliance audits and over 2,000 real estate environmental assessments throughout the country for every major industrial and commercial sector of American business.
- McLaren/Hart has provided complete environmental compliance services including compliance audits, EH&S program development, benchmarking and certification of compliance programs, regulatory permitting and training to 25 of

the top Fortune 100 companies, including DuPont, Eastman Kodak, and Sandoz Chemicals.

- McLaren/Hart has over 100 trained and experienced environmental specialists, industrial hygienists and safety experts who understand how to conduct environmental health and safety audits at all types of industrial facilities.
- McLaren/Hart has conducted auditing and related compliance programs for SEVERAL industry clients including Eaton Corporation, Eastman Kodak, Sandoz Chemicals, B.F. Goodrich, and General Electric.
- McLaren/Hart has successfully assisted other industrial companies (i.e., Texas Eastern Pipeline Corp.) with an environmental audit as part of a Consent Decree with EPA Region VIII.

A summary of McLaren/Hart project personnel qualifications is presented below. More detailed experience is presented in the resumes provided in Appendix C.

RAYMOND KANE, PE (Project Director)

Mr. Kane, Managing Principal, is a leading national expert in the field of environmental compliance management, auditing, and program development. He is a principal author in the widely used text Environmental Audits, 6th Edition. He is a frequent lecturer and trainer for industrial companies, having trained over 1,000 people in the United States and Europe on a variety of environmental topics. He has developed environmental audit and compliance management programs for the National Institute of Health, the U.S. Air Force, and several Fortune 500 companies including Kodak, Philip Morris and Sandoz. He has also managed and directed hundreds of environmental due diligence assessments for numerous financial institutions for property transactions. He is listed in "Who's Who" in the Environmental Registry and was awarded "Distinguished Instructor" from Government Institutes, Inc.

Mr. Kane will have the following responsibilities in the KNAPHEIDE Environmental Audit Project:

- Ensure that the audit is conducted in accordance with accepted auditing standards and principles;
- Review the report for technical accuracy;
- Review the report for readability;
- Review the report for defensibility; and
- Ensure that all requirements for the Audit in the Consent Agreement are met.

WILLIAM LINDSEY, PE (Project Manager)

Mr. Lindsey, Acting Regional Manager and Supervising Engineer, has performed over 50 compliance audits to determine regulatory compliance with RCRA, SARA, CWA, CAA, OSHA, and TSCA at both industrial and service oriented facilities in Missouri, Ohio, Georgia, Illinois, Oklahoma, Kansas, Arkansas, and Minnesota. Industries audited include: pulp and paper, medical, greeting card, and food and beverage. The audits have included site inspection, on-site interviews, corporate interviews, and file reviews. The investigations were often completed for historical production practices as well as current conditions.

Mr. Lindsey has been Project Manager for facility audits for the Waste Site Inspection Group (WSIG), a consortium of Fortune 50 companies. The audits evaluate RCRA permitted Treatment, Storage, and Disposal (TSD) facilities for compliance with existing permit requirements and all federal, state, and local environmental regulations which govern operation of these facilities. Facilities audited include fuel blending energy recovery cement kilns, a hazardous waste incinerator, and a medical waste incinerator.

As Project Manager for the KNAPHEIDE Audit project, Mr. Lindsey will implement the project scope of work, focus activities of team members on the KNAPHEIDE priorities during performance of the project, track budgets and deliverables, and maintain a high level of communication between the KNAPHEIDE management and project team members.

RENA' BASS (Auditor)

Ms. Bass, Associate Environmental Scientist, has been Task Manager and Team member for regulatory compliance audits for a utility company serving a four-state area. The project involved site visits and evaluation of federal, state, and local regulatory compliance for four major electrical power generating facilities, and 17 substations, service centers, vehicle maintenance facility, and public water supply operation. In addition, a supervisory review of the corporate environmental management system was performed.

Ms. Bass will provide technical support for the audit project including on-site auditing activities and evaluation follow-up.

RAY FORRESTER (MDNR and EPA Region VII Liaison)

Mr. Forrester is Vice President, Managing Principal Engineer and Regional Director for McLaren/Hart's Central U.S. operations. Mr. Forrester has over 20 years of chemical and environmental engineering experience. His extensive experience includes expertise in hazardous waste site remediation; treatment technologies (especially thermal treatment alternatives); "innovative" treatment technologies; negotiations with all levels of the Environmental Protection Agency (EPA), Department of Justice (DOJ), and State, County, and local regulatory agencies; litigation support and technical liaison with Toxic Tort and governmental litigation; expert testimony; fiscal management of environmental liabilities; community, special interest group and media interface; risk based major hazardous waste site investigation; major project management and administration; regulatory compliance; chemical and pharmaceutical process and project engineering; and financial budgeting and tracking procedures.

Mr. Forrester's role is to ensure that communication with the Missouri Department of Natural Resources and USEPA are conducted effectively to meet KNAPHEIDE project goals and objectives.

3.0 AUDIT PLAN PREPARATION

Prior to formal execution of the order, but in accordance with discussions between Knapheide's counsel and EPA counsel, authorizing certain pre-audit preparation activities, McLaren/Hart conducted several activities necessary for preparation of this audit plan. First an orientation meeting was held on March 2 and 3, 1993 with KNAPHEIDE's key management personnel. The purpose of these meetings was to obtain necessary information about the West Quincy facility's operations and activities so that this audit plan could be prepared.

In addition to conducting a pre-audit survey of the facility, McLaren/Hart prepared a pre-audit questionnaire which was completed by KNAPHIEDE as shown in Appendix A. Also as part of the audit plan preparation McLaren/Hart will develop a set of audit protocols to be used during the on-site audit.

After finalizing the scope of the plant audit, McLaren/Hart will refine the audit protocols for the site by incorporating all relevant federal, state and local regulations and requirements. These protocols will be used by the McLaren/Hart team as a tool during the plant audit, and are proven comprehensive field tested audit protocol guidelines to evaluate all areas of non-compliance. A detailed audit protocol example can be found in Appendix B. Refinements will be made as required to make them conform to EPA requirements and to be directly applicable to the West Quincy facility.

The audit protocols will include as appropriate the multi-media checklists referenced in Appendix I of the NEIC Multi-Media Investigation Manual dated March 1992.

As a result of the pre-audit survey several areas were identified at the facility which are potential areas of environmental concern. These areas will be evaluated for potential non-compliance through the audit program. Specific audit procedures are discussed in Section IV of this Plan.

4.0 ON-SITE AUDIT PROCEDURES

Once on-site, the McLaren/Hart audit team will conduct a number of activities.

Opening Meeting

The McLaren/Hart audit team will meet with the Facilities and Environmental Engineering Manager and other appropriate staff to review the audit process, schedule of activities and other related issues.

Plant Tour

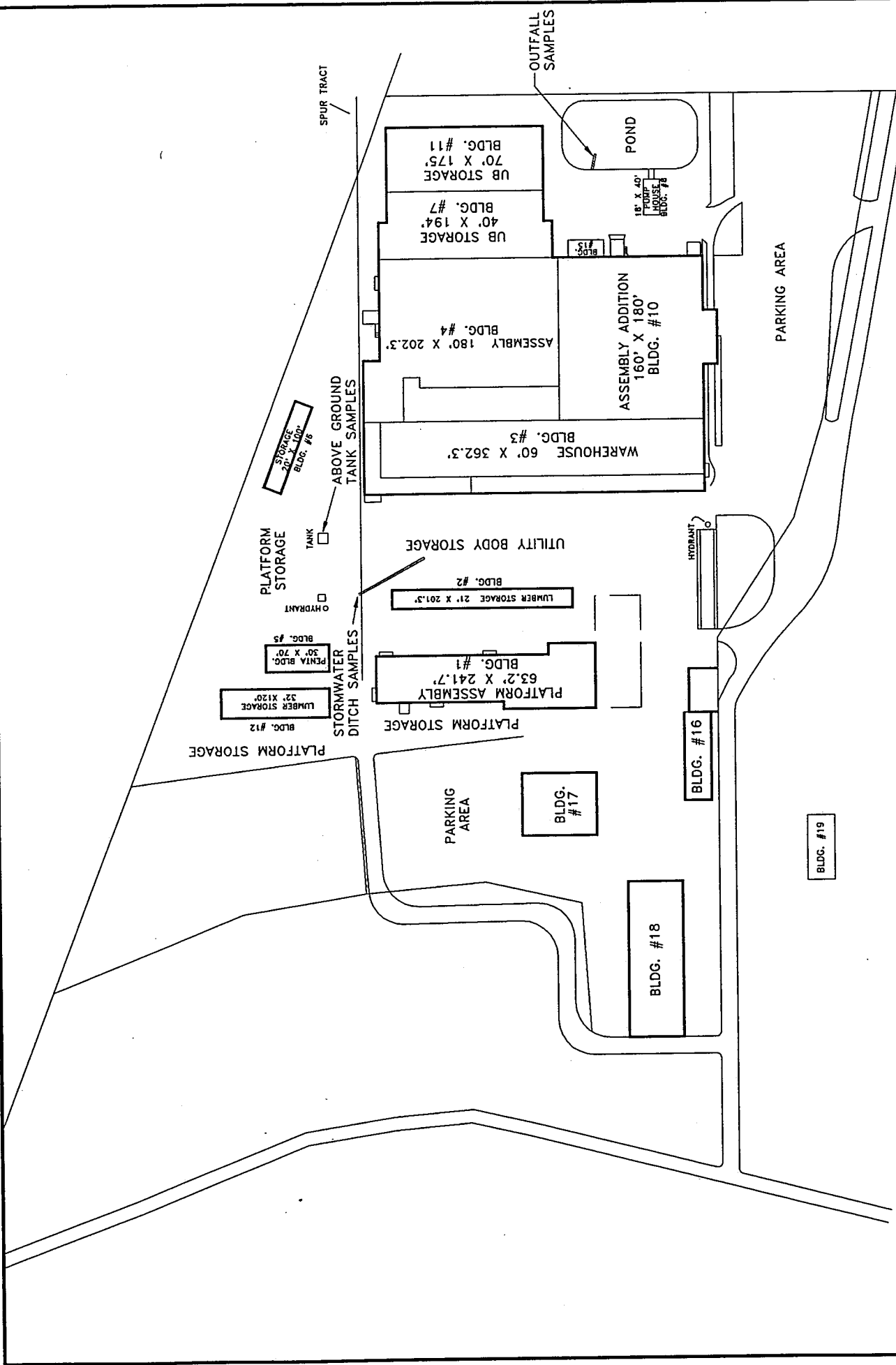
A brief tour of the West Quincy facility will be conducted to acquaint the audit team with an overview of the facility and the general location of the relevant equipment and operations. A plan of the West Quincy facility is shown on Figure 1.

Records Documentation Review

The list of facility records and related documentation, available at the plant (as listed on the Pre-Audit Questionnaire), will be reviewed for compliance requirements and performance with the requirements. In addition, the records and documents listed in Appendix H to the NEIC Multi-Media Investigation Manual will also be evaluated. The audit team will obtain copies of facility records and documents that indicate any potential non-compliance areas or environmental concerns and will include these documents in the audit report appendices. The audit report will include a list of all facility records or documents reviewed.

Detailed Facility Inspections

Using the audit protocols as a guidance tool, the audit team will inspect all appropriate facilities, equipment and operations for compliance with any applicable federal, state and local regulations. Example compliance areas to be evaluated are presented in Table 1. The audit team will photograph any portion of the facility and other equipment or operations which may present potential non-compliance issues or environmental concerns. The audit team will also examine facility equipment and operations to possibly identify opportunities to minimize waste or prevent pollution.



TITLE:

FIGURE 1
KNAPHEIDE MANUFACTURING CO.
WEST QUINCY PLANT PLAN



The Hammons Tower, 901 St. Louis Street, Springfield, MO 65805

TABLE 1

EXAMPLE COMPLIANCE AREAS IN KNAPHEIDE ENVIRONMENTAL AUDIT

	<u>Compliance Area</u>	<u>Key Audited Elements</u>
1.	Air Emissions (40 CFR 52, 60, 61)	<ul style="list-style-type: none"> - Fuel Burners - Incinerators - VOC sources - Hazardous air emissions (NESHAPS) - Fugitive emissions
2.	Wastewater Discharges (40 CFR 122, 403, 416)	<ul style="list-style-type: none"> - Direct discharge (NPDES) - Indirect discharges (POTW) - Surface water impoundments - Stormwater discharges - Treatment plant operations - Certification/licenses
3.	PCBs (40 CFR 761)	<ul style="list-style-type: none"> - In-use equipment inspection - PCB storage facility - Disposal
4.	Hazardous Waste (40 CFR 260-268)	<ul style="list-style-type: none"> - Generator requirements - Manifests/records - Off-site disposal - TSD requirements
5.	Oil Spill Control (40 CFR 112)	<ul style="list-style-type: none"> - SPCC Plans - Spill reporting - Training
6.	Pesticides (40 CFR 152-180)	<ul style="list-style-type: none"> - Application certification - Storage handling - Disposal
7.	Drinking Water (40 CFR 141)	<ul style="list-style-type: none"> - Water use permits - Sampling/analysis - Reporting to agencies
8.	Hazardous Materials (40 CFR 302)	<ul style="list-style-type: none"> - Aboveground Storage Tanks - Planning Quantity Discharges

TABLE 1
(Continued)

EXAMPLE COMPLIANCE AREAS IN KNAPHEIDE ENVIRONMENTAL AUDIT

<u>Compliance Area</u>	<u>Typical Audited Elements</u>
9. Solid Waste (40 CFR 257)	<ul style="list-style-type: none">- Permitted facilities- Monitoring for segregation- Proper disposal
10. Underground Storage Tanks (40 CFR 280)	<ul style="list-style-type: none">- Registration of tanks- Leak detection- Monitoring- Reporting
11. Community Right-to-Know (40 CFR 355, 370, 372)	<ul style="list-style-type: none">- Hazardous Substance Notification- Emergency Planning- Hazardous Material Inventory- Releases to Environment
12. Toxic Substances (40 CFR 704)	<ul style="list-style-type: none">- Reporting of Chemical Info- Retention of Chemical Info
13. Medical Wastes (40 CFR 259)	<ul style="list-style-type: none">- Collection- Packaging- Labeling- Disposal

Compliance Status Assessment

During Pre-Audit activities, McLaren/Hart identified several potential areas of environmental concern (AOEC) at the West Quincy plant. Each AOEC is discussed in this section. McLaren/Hart will include the potential AOEC's in the audit and will conduct the following activities to assess the compliance status of the plant. For each potential AOEC, the past history of the AOEC including general physical condition, past and current operating practices, age, and actual and potential materials used, will be identified. The audit will examine the conditions at the facility resulting from past or on-going activities which could have resulted in non-compliance with existing, federal, state, or local regulations. For each AOEC, any federal, state or local regulations which would regulate operations in the AOEC, will be identified. The audit team will photograph potential AOEC's, examine the area surrounding the AOEC for signs of potential releases, and will photograph any visible signs of a release.

The AOEC's and proposed audit activities are discussed below.

- **Wood Treatment Areas**

This includes the building where wood was treated; covered areas where treated wood was stored; and areas where raw materials and waste products from this process were stored. Historically, wooden boards were treated at the plant by submersion in pentachlorophenol. The facility switched from pentachlorophenol to Koppers Wood Treatment MB (which contains no pentachlorophenol) in 1986. The excess wood treatment solution on treated boards was allowed to drip back into the dipping pit. All wood treatment activities were conducted indoors. Treated boards were stored in a covered air drying area.

During the audit, information concerning each wood treatment area including the period of operation, the specific activity conducted in the area, and any preservatives other than pentachlorophenol used in the area, will be identified. The audit will identify if drip pad requirements of 40 CFR 265 Subpart W would apply.

- **Potential Fuel Spill Area/Formal Underground Tank Areas**

Two areas of contaminated groundwater are documented at the site which are referred to as the Potential Fuel Spill Area and the Former Underground Tank Area. There are 14 existing monitoring wells at the site that were installed to determine the extent of groundwater contamination. Reports concerning these sampling episodes were submitted to MDNR. These potential AOEC's will be visually examined and related facility documents will be reviewed to the extent necessary to verify progress and the need for additional work.

- **Fire Pond**

The fire pond receives stormwater and washwater from steam cleaning and other operations at the plant. The fire pond will be included as part of the plant audit.

The audit will evaluate NPDES permitting requirements for any pond overflow points.

In order to evaluate opportunities for pollution prevention or pollution reduction projects in the plant, McLaren/Hart will collect samples from the plant pipe of the washwater entering the pond. The analytical results will provide a baseline to assess pollution prevention or reduction opportunities. Potential pollution prevention opportunities such as changing process operations, material substitutions and pollution reduction opportunities such as a new end-of-pipe treatment system will be identified.

Samples will be taken from the end of the pipe emptying into the pond and, to the extent possible, samples will be collected from each component waste stream discharging to the pond. At this time the number of component waste streams is unclear. However, McLaren/Hart anticipates the collection of 5 wastewater samples. These samples will also be analyzed for metals, semi-volatile organics, and volatile organics by EPA SW-846 methods. Sample locations are shown in Figure 1.

- **Aboveground Storage Tank Area**

There are two aboveground storage tank areas that do not have secondary containment. These tanks and the surrounding area will be included in the audit. The following information concerning the tanks will be obtained during the audit; the capacity and age of each tank, the materials stored in each tank, and the dates that materials were stored in each tank. McLaren/Hart will include the areas of these tanks in a soil gas/geoprobe screening. Based upon results of the soil gas/geoprobe screening, McLaren/Hart will collect soil borings in areas around the tanks where releases could have occurred. The purpose of the samples is to evaluate the potential for environmental restoration opportunities. Restoration opportunities exist because it is likely that petroleum product spills of less than reportable quantities may have occurred historically at the aboveground storage tank area. Since petroleum products are not regulated, unless spills are above reportable quantities, this area would not be regulated and clean-up levels are not established. The samples identify opportunities to restore soils in the area.

The samples will be hand augered borings. Samples will be taken from near the surface, at a depth of two feet, and at a depth of five feet. Field observations may suggest alternative or additional depths. These samples will be analyzed for total petroleum hydrocarbons by EPA SW-846 method 8015M. The number of locations sampled will be based upon reconnaissance of the areas, but we estimate that four locations will be sampled and 12 samples will be analyzed by this method. Sample locations are shown in Figure 1.

- **Stormwater Ditches**

Stormwater and surface water runoff is managed at the site by a number of surface drainage ditches. The audit will identify the ditch location in the report and evaluate the need for a stormwater NPDES permit for ditch discharges. McLaren/Hart will collect composite surface soil samples in this series of drainage ditches. As a minimum, a grab sample will be collected in each ditch area exhibiting the highest potential for contamination and where the ditch leaves the facility property. These samples will provide a baseline to assess possible pollution prevention/reduction opportunities and best management practices for stormwater runoff. Composites will be collected by sampling along a line at the bottom of the ditch. Sample aliquots will be collected at regular intervals along each line. These aliquots will be combined to form a single composite sample for each line. Determination of the location for each line of samples will be based upon ditch confluences and stormwater entry points. It is anticipated that each line will be 100 feet long and each composite will contain 10 aliquots. However, these parameters may be changed upon observation of field conditions. In any case, McLaren/Hart will attempt to keep the area represented by each composite sample consistent, to allow comparison of the results. We estimate that five composite samples will be collected. Each composited sample will be analyzed for metals and semi-volatile organic compounds by EPA SW-846 methods 6010/7000, and 8270, respectively. Selected grab samples will be analyzed for volatile organic compounds by Method 8240. Grab samples analyzed for volatile organic compounds will not be composited.

- **Drum Storage Area**

Empty drums are stored outside on site. The McLaren/Hart audit team will include this area in the facility audit. The audit team will identify the type of materials that were stored in the drums, the potential hazardous nature of the former drum materials, and the dates drums were stored in the area. The audit will identify if the drum storage area is subject to 40 CFR Parts 262, 264, or 265.

- **Waste Storage Building**

McLaren/Hart will include the waste storage building and the surrounding area as part of the facility audit. The audit team will identify the type of materials that were stored in the building, whether the waste was hazardous, and the dates drums in which the waste storage building was used to store hazardous waste, if any. The audit will identify if the drum storage area is subject to 40 CFR Parts 262, 264, or 265.

- **Sand Blasting and Paint Hook Cleaning Areas**

A covered shed is used for sand blasting activities. Paint hooks have also been cleaned in this covered shed by use of a blow torch. Residuals are allowed to accumulate on the ground, with no known containment. Previously, spent sand samples have been collected and analyzed. The audit team will include the sand

blasting and paint hook cleaning areas as part of the facility audit. After reviewing previous sampling data, McLaren/Hart will make an evaluation as to the regulatory status of the spent sand and sandblasting area. The audit team will evaluate if paint removal by blow torch is considered treatment per 40 CFR Parts 262, 264, or 265.

- **Air Emission Sources**

McLaren/Hart will include the 11 paint booths as part of the facility audit. In order to evaluate opportunities for pollution prevention or pollution reduction projects, McLaren/Hart will sample air emission sources at the filter outlet of the 11 paint booths. In addition, we will collect two ambient air samples inside the building in the area of the paint booths and the dip tanks. The samples will be analyzed for volatile organics and metals using industrial hygiene type samples. The analytical results will provide a baseline to assess pollution prevention or reduction opportunities. Potential pollution prevention opportunities such as operation modifications or material substitutions and pollution reduction opportunities such as new end-of-pipe treatment systems will be identified.

F. Interviews

Interviews are a very important part of the audit process. Interviews will be conducted during the audit but prior to any sampling. Questions will be asked about compliance related items and will be focused on obtaining only relevant information pertaining to the environmental operations at the plants. McLaren/Hart is keenly adept at identifying problems based on responses from interview questions. Interviewing guidance that all McLaren/Hart auditors are trained to follow is presented in Table 2.

Approximately five West Quincy employees are planned for interviews. The following names and position titles of KNAPHEIDE-West Quincy employees planned for interviews are:

Name	Title
Harold Knapheide III	President
Gerry Korb	Vice President, Operations
Harold Huggins	Facilities and Environmental Engineering Manager
Bryce Butler	Plant Manager - West Quincy
Ron Hubble	Side Assembly Manager

Notes from the interviews will be hand recorded and summaries will be included as a report appendix. The maximum time between the interview and preparation of the summary report will be 72 hours.

TABLE 2

INTERVIEWING GUIDANCE CHECKLIST

1. Call the interviewee and schedule the exact time and place of the interview at least a few hours ahead of time.
2. Upon meeting the interviewee introduce yourself and explain who you are, where you are from, and why you are at the facility.
3. First, relax the interviewee and get him to explain who he is and his roles and responsibilities.
4. Don't become captive to your checklist so that effective communication is hampered.
5. Ask open-ended questions, avoid too many yes/no type questions.
6. Don't ask questions about compliance items that can be better evaluated by physical inspection or documentation review at a later stage of the audit.
7. Don't preach to or intimidate the interviewee by your superior knowledge of the regulations. Don't quote or provide citations unless this information is requested and you think it will help the interviewing process.
8. Ask the interviewee about previous audits/inspections relative to the compliance area you are auditing. It's a good place to start.
9. Solicit input from the interviewee about how the audit should be conducted for maximum effectiveness. Make him a part of the audit process not the object of it.
10. Be careful not to tell or order the interviewee to do anything during the interview. Remember you are there to obtain information and identify problems, not solve them during the audit. That will come later.
11. When appropriate and if it helps the interview to proceed more effectively, general comments may be made by the auditor that are instructional in nature as long as they are not construed to be directives from the auditor.
12. As noncompliance items are being identified, don't make the interviewee uncomfortable by your reaction. Continue to assure him that the audit is not intended to be a personal inquisition but a process to identify problems that are typically found at many facilities.
13. Be empathetic as you talk to the interviewee but don't cross the line and become too sympathetic to his problems. The interview could drag on longer than it needs to.
14. Be quick to recognize the "hostile interviewee" who doesn't want to cooperate, from the "nervous interviewee" who is just too uptight about being questioned.

Exit Meeting

Following the audit, McLaren/Hart's audit team will conduct an exit meeting with KNAPHEIDE to present an overview of the findings. No documentation will be provided but a complete verbal report will be made. All findings will be categorized according to regulatory findings and good management practice findings.

5.0 PREPARATION OF DRAFT AUDIT REPORT

Upon completion of the audit, McLaren/Hart will prepare Draft and Final Environmental Audit Reports. In addition to the specific information listed in Section 4.0, the Audit Report will include the following:

- A description of the plant and the regulatory history and current compliance status of the plant, including identification of waste streams, emissions and releases to all environmental media and identification of all Solid Waste Management Units at the plant;
- Each federal, state, or local environmental law or regulation identified as being applicable to the plant.
- Each instance of non-compliance with federal, state or local environmental laws or regulations, including identification of the law or regulation, the area in the plant where the non-compliance occurred, the dates of the non-compliance, and any other relevant or appropriate information regarding the non-compliance, including but not limited to a schedule and plan for coming into compliance; and
- Any other information which, in the judgement of McLaren/Hart, merits review or comment, including any recommendation as to suggested improvements and/or modifications which could be made to KNAPHEIDE's procedures or its facility to facilitate compliance with environmental laws and regulations or benefit the environment independent of regulatory status, including preliminary descriptions of any projects which may constitute Supplemental Environmental Projects (SEPs) within the definition of EPA's February 12, 1991 "Policy on the Use of Supplemental Enforcement Projects in EPA Settlement Agreements", including a cost estimate/budget, implementation schedule and statement of environmental benefits for such SEPs.

Some guiding principles McLaren/Hart follows when preparing audit reports are as follows:

- Be clear and concise;
- Do not use indefinite adjectives;

- Base findings on evidence not conjecture or opinion;
- Avoid use of slang terms and acronyms; and
- Include commendatory items discovered during the audit.

The report will include recommendations to address regulatory compliance problems and also improve environmental performance.

McLaren/Hart's philosophy is that audit reports should focus on underlying "root causes" of problems not just "symptoms" of problems. Therefore, our recommendations often identify fundamental management control issues.

Management systems recommendations might include items such as:

- Establishing additional training programs or updating existing programs;
- Developing improved plant operating procedures and policies; and
- Clarifying position descriptions and responsibilities of key plant environmental staff.

After receiving comments from the Draft Audit Report, McLaren/Hart will make appropriate revisions and submit the Final Audit Report to KNAPHEIDE who in turn can submit the Audit Report to EPA.

6.0 SCHEDULE FOR THE AUDIT

The schedule for performance of the audit is shown below. The dates shown are based on the effective date of the Order which is March 10, 1993.

EVENT/MILESTONE	DATE
1. Order Effective	March 10, 1993
2. Environmental Audit Plan Submittal to EPA	May 10, 1993
3. EPA Review of Audit Plan (Assume 30-day review by EPA)	June 10, 1993
4. Address EPA Comments/Revised Audit Plan Submittal	July 1, 1993
5. EPA Approval of Revised Audit Plan (Assumes 3-week review by EPA)	July 22, 1993
6. Completion of On-site Audit	August 6, 1993 ⁽¹⁾
7. Submission of Environmental Audit Report to EPA	September 3, 1993 ⁽¹⁾

⁽¹⁾ Assumes EPA approval of Revised Audit Plan July 22, 1993.

7.0 COST ESTIMATE/BUDGET

A cost estimate/budget has been prepared for the Audit Plan, the Environmental Audit, and the Environmental Audit Report. Each cost estimate is presented below.

Audit Plan Cost Estimate

Costs for the Audit include:

- Orientation Meeting in West Quincy, Missouri March 2 and 3, 1993;
- Preparation of Pre-Audit Questionnaire, Audit Protocols, and Audit Plan document; and
- Travel expenses for Mr. Kane (Philadelphia, Pennsylvania to West Quincy) and Mr. Lindsey (Springfield, Missouri to West Quincy) on March 2 and 3, 1993.

The personnel, title, and work activities for this task are included in the following cost estimate.

TABLE 3 - AUDIT PLAN COSTS

Name	Billing Title	Work Activity	Billing Rate	Hours	Cost
Raymond Kane	Managing Principal	Audit Plan Prep	\$157.50	14	\$2,205.00
William Lindsey	Supervising Engineer	Audit Plan Prep	\$112.50	17	\$1,912.50
Tina Garner	Supervising Engineer	Audit Plan Prep	\$112.50	1.5	\$ 168.75
Rena' Bass	Associate Environmental Scientist	Audit Plan Prep	\$67.50	36	\$2,430.00
Dawn Bills	Secretary	Audit Plan Prep	\$40.50	19	\$ 769.50
Subtotal				87.5	\$7,485.75
Travel Costs:				Subtotal	\$1,400.00
Hotel: 4 nights at \$60/night				\$ 240	
Airfare (R. Kane): One Round Trip Philadelphia to Quincy, IL				\$ 800	
Car Rental/Expenses: 2 days at \$40 + \$150				\$ 230	
Meals: 4 days at \$32.50/day				\$ 130	
				\$1,400	
TOTAL					\$8,885.75

Environmental Audit Cost Estimate

The personnel, title, and work activities for this task are included in the following cost estimate. Hours spent by the audit team on-site will be divided between the facility inspection, records review, and interviews. Costs for the audit include McLaren/Hart staff on site for three to four days. Hours to be spent by McLaren/Hart staff who will primarily be involved with compliance sampling/testing at potential solid waste management units at the facility are indicated.

TABLE 4 - ENVIRONMENTAL AUDIT COSTS

Name	Billing Title	Work Activity	Billing Rate	Hours	Cost
Raymond Kane	Managing Principal	Audit	\$157.50	20	\$ 3,150.00
William Lindsey	Supervising Engineer	Audit	\$112.50	28	\$ 3,150.00
Rena' Bass	Associate Environmental Scientist	Audit	\$67.50	16	\$ 1,080.00
Dawn Bills	Secretary	Support	\$40.50	12	\$ 486.00
Sandra Potter	Sr. Associate Geoscientist	Sampling	\$81.00	24	\$ 1,944.00
Ben Francka	Associate Geoscientist	Sampling	\$67.50	24	\$ 1,620.00
Subtotal				124	\$11,430.00
Travel Costs:			<u>Subtotal</u>		
Hotel: 20 nights at \$60/night			\$1,200.00		
Airfare (R. Kane): 1 Round Trip			\$ 800.00		
Car Rental/Expenses: 5 days at \$40 + \$200			\$ 400.00		\$ 3,625.00
Meals: 20 days at 32.50/day			\$ 650.00		
Miscellaneous supplies:			<u>\$ 575.00</u>		
			\$3,625.00		
Analytical⁽¹⁾					\$24,150.00
TOTAL					\$39,205.00

(1) See Table 5 for a detailed listing of analytical costs.

TABLE 5 - DETAILED ANALYTICAL COST ESTIMATE

Wood Treatment Area: No Samples

Potential Fuel Spill Area / Former Underground Tank Area: No Samples

Fire Pond: Water Samples to Classify Potential Pollution Prevention

Location	Number of Samples Proposed	Media Sampled	Analysis Performed	EPA Analysis Method	Cost per Sample	Total Cost
Wastewater from Waste Streams comprising Final Stream, as well as the Final Stream entering the Lagoon	5	Water	Metals	SW-846 6010/7000	\$210.00	\$1,050.00
	5	Water	Semivolatile Organics	SW-846 8270	\$400.00	\$2,000.00
	5	Water	Volatile Organics	SW-846 8240	\$215.00	\$1,075.00
Lagoon Analytical Costs						\$4,125.00

Aboveground Storage Tank Area: GeoProbe Investigation and Soil Samples

Location	Number of Samples Proposed	Media Sampled	Analysis Performed	EPA Analysis Method	Cost per Sample	Total Cost
Geoprobe Screening of the Area to Determine Precise Location for Potential Additional Monitoring Wells includes operators, Photovac GC, and Mob/DeMob	Days	1			\$3,625.00	\$3,625.00
Determine Potential Release Sites in the Above Ground Tank Area	12	Soil	Total Petroleum Hydrocarbons	SW-846 8015M	\$125.00	\$1,500.00
Above Ground Storage Tank Area Analytical Costs						\$5,125.00

TABLE 5 - DETAILED ANALYTICAL COST ESTIMATE

Stormwater Ditches

Location	Number of Samples Proposed	Media Sampled	Analysis Performed	EPA Analysis Method	Cost per Sample	Total Cost
Samples consisting of 10 Aliquots each from the base of drainage ditches & 2 Grab Samples	7	Soil	Metals	SW-846 6010/7000	\$210.00	\$1,470.00
	7	Soil	Semivolatile Organics	SW-846 8270	\$450.00	\$3,150.00
	7	Soil	Volatile Organics	SW-846 8240	\$240.00	\$1,680.00
Stormwater Ditch Analytical Costs						\$6,300.00

Drum Storage Area: No Samples

Waste Storage Building: No Samples

Sand Blasting Area: No Samples

Paint Hook Cleaning Area: No Samples

Air Monitoring

Utilize Subcontractor to monitor emissions from Identified Sources	As Required	Air	-	-	-	\$8,600.00
Air Monitoring Analytical Costs						\$8,600.00

Total Analytical, Geoprobe and Air Monitoring Cost \$24,150.00

Audit Report Cost Estimate

Costs for the Audit Report include labor by McLaren/Hart auditors to document the findings as described previously in the Audit Plan. Also included in the estimate is time to make revisions to the draft report after review by KNAPHEIDE.

The personnel, title, and work activities for this task are included in the following cost estimate.

TABLE 6 - AUDIT REPORT COSTS

Name	Billing Title	Work Activity	Billing Rates	Hours	Cost
Raymond Kane	Managing Principal	Report	\$157.50	31.0	\$4,882.50
Ray Forrester	Managing Principal	Report	\$157.50	5.0	\$787.50
William Lindsey	Supervising Engineer	Report	\$112.50	50.0	\$5,625.00
Tina Garner	Supervising Engineer	Report	\$112.50	4.5	\$506.25
Rena' Bass	Associate Env. Scientist	Report	\$67.50	71.0	\$4,792.50
Dawn Bills	Secretary	Report	\$40.50	47.0	\$1,903.50
Subtotal				208.5	\$18,497.25
Travel Costs					\$0.00
TOTAL					\$18,497.25

TABLE 7 - SUMMARY OF COSTS

	Labor	Analytical	Travel Expenses	Total
Audit Plan	\$ 7,485.75	N/A	\$1,400.00	\$ 8,885.75
Environmental Audit	\$11,430.00	\$24,150	\$3,625.00	\$39,205.00
Audit Report	\$18,497.25	N/A	N/A	\$18,497.25
Total	\$37,413.00	\$24,150	\$5,025.00	\$66,588.00

Appendix A
COMPLETED PRE-AUDIT QUESTIONNAIRE

THE KNAPHEIDE MANUFACTURING COMPANY

PRE-AUDIT QUESTIONNAIRE

LOCATION NAME: THE KNAPHEIDE MFG. CO.

ADDRESS: HIGHWAY #24 WEST
WEST QUINCY MO 63471

PHONE NUMBER: 217/222-7131

PRIMARY CONTACT
NAME AND TITLE: HAROLD HUGGINS, FACILITIES AND ENVIRONMENTAL MANAGER

DATE COMPLETED: MARCH 22, 1993

RETURN TO: William B. Lindsey, P.E.
% McLaren/Hart Environmental Engineering
901 St. Louis Street
Springfield, MO 65806

GENERAL INFORMATION DATA SHEET

MAJOR ACTIVITIES CURRENTLY PERFORMED AT THIS LOCATION:

PIECE PART MODIFICATION AND ASSEMBLY OF TRUCK EQUIPMENT

LIST THE 10 MOST USED MATERIALS (include solids, liquids, gases):

- | | | | |
|----|----------------------|-----|--|
| 1. | HOT ROLL STEELS | 6. | |
| 2. | A40 GALV STEELS | 7. | |
| 3. | SIKKENS PAINTS | 8. | |
| 4. | BARTON SOLVENTS | 9. | |
| 5. | TROY CLEAN CHEMICALS | 10. | |

HAVE THERE BEEN ANY CHANGES IN EITHER THE MATERIALS OR WORK PROCEDURES USED IN THE PAST 10 YEARS? IF YES, PLEASE DESCRIBE:

CHANGE FROM VALSPAR TO SIKKENS PAINT

CHANGE FROM DETREX TO TROY CHEMICALS

IS THE LOCATION PROPERTY OWNED OR LEASED: OWNED AND LEASED

WHEN WAS THE PROPERTY FIRST ACQUIRED OR LEASED: 1952 WEST QUINCY

DESCRIBE THE DATES, OWNERSHIP, AND USE(S) OF THE PROPERTY AS FAR BACK AS POSSIBLE, PRIOR TO THE DATE OF ACQUISITION OR LEASE:

1952 - 1993 - WEST QUINCY ASSEMBLY AND SHIPMENT

PLEASE DESCRIBE THE NATURE OF OTHER INDUSTRIES LOCATED WITHIN A RADIUS OF THREE MILES (light, medium, heavy industrial; refineries; steel mills; etc.):

WEST QUINCY FARMING AND LIGHT INDUSTRIAL

ARE THERE ANY WETLANDS LOCATED WITHIN A ONE-MILE RADIUS? IF YES, PLEASE PROVIDE DESCRIPTION AND LOCATION.

WEST QUINCY; FABIUS DRAINAGE DISTRICT

AIR EMISSIONS DATA SHEET

DOES THIS LOCATION HAVE ANY TYPE OF AIR EMISSION PERMITS?

____ YES ☒ NO ____ DON'T KNOW

IF YES, PLEASE GIVE TYPE OF PERMIT AND ISSUING AGENCY:

ARE THERE ANY SMOKESTACKS/CHIMNEYS/VENTS AT THIS LOCATION?:

☒ YES ____ NO ____ DON'T KNOW

ARE THERE ANY OTHER POTENTIAL SOURCES OF AIR EMISSIONS (For example paints, solvents, aerosols) AT THIS LOCATION?:

☒ YES ____ NO ____ DON'T KNOW

IF YES, PLEASE DESCRIBE TYPES:

WEST QUINCY; 11 PAINT BOOTHS AND 1 DIP PAINT ROOM

DOES THIS LOCATION USE FREON? IF YES, DESCRIBE THE MAINTENANCE AND HANDLING PROCEDURES.

AC ONLY

WASTEWATER DATA SHEET

DOES THIS LOCATION HAVE ANY PERMITS FOR DISCHARGE OF STORMWATER OR WASTEWATER OF ANY TYPE?

☒ YES ☐ NO ☐ DON'T KNOW

IF YES, PLEASE GIVE TYPE OF PERMIT AND ISSUING AGENCY:

WEST QUINCY; APPLIED FOR GENERAL PERMIT (AIM)

IS THERE ANY KIND OF WASTEWATER DISCHARGED AT THIS LOCATION OTHER THAN NORMAL SANITARY WASTEWATER (toilets, sinks for routine hand-washing)?

☒ YES ☐ NO ☐ DON'T KNOW

IS THERE ANY TYPE OF WATER DISCHARGE TO THE OUTSIDE AT THIS LOCATION?
(Sink drains, floor drains, etc.)

☒ YES ☐ NO ☐ DON'T KNOW

DOES THIS LOCATION PRODUCE ANY KIND OF PROCESS OR INDUSTRIAL WASTE WATER?

☒ YES ☐ NO ☐ DON'T KNOW

DOES THIS LOCATION EXPERIENCE A LARGE AMOUNT OF STORMWATER RUNOFF FROM BUILDING DRAINAGE PIPES OR ROOF DRAINS?

☒ YES ☐ NO ☐ DON'T KNOW

SOLID AND HAZARDOUS WASTE DATA SHEET

SECTION 1 -- NON-HAZARDOUS WASTES

TYPE/COMPOSITION (Please describe waste and note volume generated per month):

- 1) GENERAL/COMMERCIAL _____ Volume: 8,000 LBS
- 2) INDUSTRIAL FILTERS/THINNER/OIL Volume: SEE SHEET 7
(i.e., paint filters/sludge/rejects/oil not combined with PCB, etc.)
- 3) OTHER SCRAP STEEL Volume: 34,913 LBS
- _____ Volume: _____
- _____ Volume: _____

METHOD OF DISPOSAL: _____ ON-SITE X OFF-SITE _____ BOTH

- _____ Dump/Landfill Volume: _____
- _____ Incineration Volume: _____
- X Other: FUELS PROGRAM Volume: _____
- _____ Volume: _____

LOCATIONS OF OFF-SITE WASTE DISPOSAL SITES (list name and address):

- 1) BFI QUINCY IL
- 2) CLAYTON CHEMICAL SAUGET IL
CHIEF SUPPLY INC HASKELL OK
- 3) MCKINLEY IRON ST LOUIS MO

SECTION 2 -- H A Z A R D O U S W A S T E S EPA I.D. #: IL9291278068
MOD000766998

DESCRIBE THE TYPES OF HAZARDOUS WASTE ACTIVITIES CONDUCTED AT THIS LOCATION IN THE FOLLOWING SECTIONS:

 X GENERATOR (List the types of wastes generated, by name or EPA code, and the average pounds generated per month):

FILTER	D001-D007	5000 LBS
THINNER	D001, D007, D008, D018, D035, F003, F005	5000 LBS
OIL	D035	200 LBS

 N/A STORER (List the types of wastes, by name or EPA code, that are stored on-site in drums, tanks, etc., for greater than 90 days, and the maximum quantity in storage at any time in pounds):

 N/A TREATER (List the types of wastes, by name or EPA code, that are treated to the point where they no longer meet the definition of hazardous waste, the treatment methods utilized, and the maximum quantity treated per month):

 N/A DISPOSER (List the types of wastes, by name or EPA code, that are disposed of on-site, the disposal methods, and the quantity disposed monthly):

N/A RECLAIMER

(List the types of wastes, by name or EPA code, that are reclaimed on-site, and the monthly quantity):

IF HAZARDOUS WASTES ARE STORED, TREATED, DISPOSED, OR RECYCLED OFF-SITE, PLEASE COMPLETE THE FOLLOWING FOR ALL SITES USED CURRENTLY AND IN THE PAST:

	Site Name	Location	Type and Volume of Waste Sent	Currently Used or Date Last Used
	<u>SEE SHEET #6</u>	<u></u>	<u></u>	<u></u>
(PAST)	<u>WASTE RESEARCH</u>	<u>EAU CLAIRE WI</u>	<u>30,000 LBS.</u>	<u>1986</u>
	<u>VAN WATERS</u>	<u>BURLINGTON IA</u>	<u>SEE MANIFEST</u>	<u>1987</u>
	<u>STABLEX</u>	<u>ROCKHILL SC</u>	<u>SEE MANIFEST</u>	<u>1987</u>
	<u>INTERSTATE POLLUTION</u>	<u>ROCKFORD IL</u>	<u>SEE MANIFEST</u>	<u>1990</u>
	<u>PETRO-CHEM</u>	<u>DETROIT MI</u>	<u>SEE MANIFEST</u>	<u>1991</u>
	<u>CONTINENTAL CEMENT</u>	<u>HANNIBAL MO</u>	<u>SEE MANIFEST</u>	<u>1992</u>
	<u></u>	<u></u>	<u></u>	<u></u>

REGULATORY CONTACT (please provide the name, title, affiliation, and telephone number of local, state, or federal officials who are regularly involved in hazardous and solid waste issues at the location):

HAS THE LOCATION BEEN CITED FOR VIOLATION OF HAZARDOUS OR SOLID WASTE REGULATIONS IN THE PAST THREE YEARS? IF YES, PLEASE DESCRIBE:

MISSOURI DNR OPEN BURNING AND INCINERATOR VIOLATION

MISCELLANEOUS INFORMATION DATA SHEET

SECTION 1 -- UNDERGROUND TANKS AND PIPING

DOES THE LOCATION HAVE ANY UNDERGROUND STORAGE TANKS:

☒ YES ☐ NO ☐ DON'T KNOW

IF YES, HOW MANY? ☐ ACTIVE ☒ 2 INACTIVE

IF YES, PLEASE PROVIDE THE FOLLOWING INFORMATION FOR EACH TANK:

SIZE (gallons)	AGE	CONTENTS	CONSTRUCTION MATERIAL	CATHODIC PROTECTION? SECONDARY CONTAINMENT?
(TANKS CLOSED IN PLACE)				

ARE THE INDICATED TANKS REGISTERED WITH THE STATE?

☒ YES ☐ NO ☐ DON'T KNOW

HAS THE INTEGRITY OF TANKS AND LINES BEEN TESTED?

☐ YES ☒ NO ☐ DON'T KNOW

DOES THE LOCATION HAVE:

UNDERGROUND PIPING ☒ YES ☐ NO ☐ DON'T KNOW

SEWER LINES ☐ YES ☒ NO ☐ DON'T KNOW

SUMPS ☐ YES ☒ NO ☐ DON'T KNOW

SECTION 2 -- P C B s

DOES THE LOCATION HAVE ANY PCB OR PCB-CONTAMINATED TRANSFORMERS OR CAPACITORS IN USE AT THE SITE?

____ YES ☒ NO ____ DON'T KNOW

DOES THE LOCATION HAVE ANY PCB OR PCB-CONTAMINATED TRANSFORMERS OR CAPACITORS WHICH ARE OUT OF USE AND IN STORAGE AT THE SITE?

____ YES ☒ NO ____ DON'T KNOW

DID THE LOCATION EVER USE OR STORE ANY PCB OR PCB-CONTAMINATED TRANSFORMERS OR CAPACITORS AT THE SITE?

____ YES ☒ NO ____ DON'T KNOW

SECTION 3 -- COMMUNITY RIGHT-TO-KNOW

DOES THE LOCATION HAVE A REPRESENTATIVE (FACILITY COORDINATOR) PARTICIPATE IN THE LOCAL EMERGENCY PLANNING COMMITTEE (LEPC)?

____ YES ____ NO ☒ DON'T KNOW

IF YES, IS A FILE MAINTAINED FOR CORRESPONDENCE WITH THE LEPC AND THE MISSOURI EMERGENCY RESPONSE COMMISSION?

☒ YES ____ NO ____ DON'T KNOW

DOES THE LOCATION REPORT UNDER SARA TITLE III - HAZARDOUS CHEMICAL INVENTORIES (SECTIONS 311 AND 312)?

☒ YES ____ NO ____ DON'T KNOW

DOES THE LOCATION REPORT UNDER SARA TITLE III - TOXIC CHEMICAL RELEASE REPORTING (FORM R) (SECTION 313)?

☒ YES ____ NO ____ DON'T KNOW

IS A FILE MAINTAINED FOR ANY SUBMITTED SARA TITLE III REPORTS AND BACKUP DOCUMENTATION?

☒ YES ____ NO ____ DON'T KNOW

PRE-AUDIT QUESTIONNAIRE

**** PRE-AUDIT INFORMATION COLLECTION LIST ****

P L E A S E N O T E

1. The documents, records, and files noted on the following pages are typical information the audit team will want to review.
2. The following list is provided as a guide, so the location can compile the information prior to the audit team arriving on site. This will greatly facilitate an efficient audit.
3. It is not required nor intended that copies of any of this material be made prior to the audit.
4. It is not required nor intended that any of this information be sent to McLaren/Hart or other locations prior to the audit team arriving on site. The audit team will review this material upon arrival at the location.

PRE-AUDIT INFORMATION COLLECTION LIST

MATERIALS TO BE COLLECTED, IF FEASIBLE PRIOR TO SITE VISIT

A. AIR EMISSIONS

1. Copies of all current air permits.
2. Air monitoring data for the past 12 months.
3. Air emission inventory.
4. Air emission reports submitted to regulatory agencies for the past 12 months.
5. Copies of any violation notices received in the past three years.

B. WASTEWATER

1. Copies of all EPA or Municipal Sewer permits.
2. Copies of discharge monitoring data for last two years for flow and permit parameters.
3. Any complete (organic/inorganic) analyses of process, cooling, or storm water streams.
4. Water use records for the past 12 months.
5. Copies of any violation notices received in the past three years.

MATERIALS TO BE COLLECTED, IF FEASIBLE, PRIOR TO SITE VISIT

C. HAZARDOUS WASTES

1. RCRA Permits.
2. Hazardous Waste Manifests for the past 12 months.
3. Copies of Preparedness and Prevention/
Contingency Plans.
4. Waste Analysis data for all hazardous waste streams.
5. Latest Generators Report to EPA/State.
6. Copies of any violation notices received in the past
three years.
7. Copies of any notices of involvement at "Superfund"
sites.
8. Copy of Waste Minimization Plan.

D. TANKS

1. Listing of all above ground storage tanks including:
capacity, contents, use, and volume capacity of
secondary containment system.
2. A copy of the underground tank registration form(s)
submitted to any authority.
3. A copy of the site's Spill Prevention Control and
Countermeasure Plan

MATERIALS TO BE COLLECTED, IF FEASIBLE, PRIOR TO SITE VISIT

E. POLYCHLORINATED BIPHENYLS (PCBs)

1. A copy of an annual PCB report.
2. PCB test results from analysis on electrical equipment.
3. Copies of any violation notices received in the past three years.

F. GROUNDWATER

1. Well construction diagrams for on-site water supply or groundwater monitoring wells.
2. Water quality analyses from water supply or groundwater monitoring wells for the past 12 months.

G. PREVIOUS REPORTS

1. Previous environmental assessment reports.
2. Previous environmental audit reports.
3. Previous asbestos surveys.
4. Other reports pertinent to audit (provide details).

Appendix B
EXAMPLE AUDIT PROTOCOL

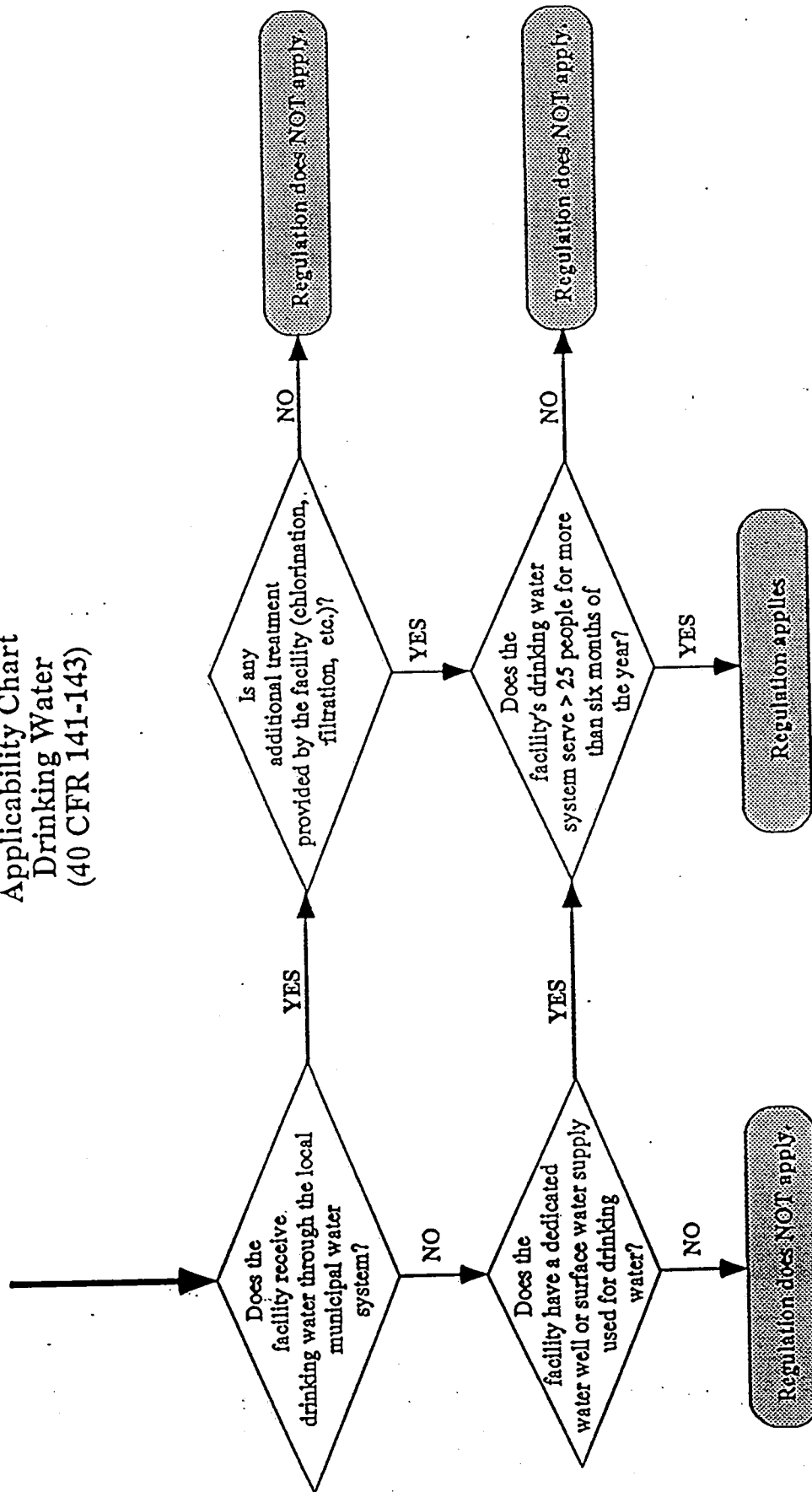
CONFIDENTIAL
PREPARED UNDER ADVICE OF ATTORNEY

COMPLIANCE AUDIT PROGRAM

DRINKING WATER QUESTIONNAIRE

40 CFR 141

Applicability Chart
Drinking Water
(40 CFR 141-143)



AUDIT PROGRAM - DRINKING WATER

INSTRUCTIONS

The following questionnaire addresses the Federal Drinking Water regulations (40 CFR 141). The questions follow a logical progression. Read the questions carefully. Be sure also to follow the shaded box instruction found in the question column. Answers should be entered in the boxes to the right with an "X" or "✓" over the corresponding answer:

- Y - yes
- N - no
- NA - not applicable
- DK - do not know

The shaded answer boxes, typically "N" or "DK" indicate an area which should be revisited with respect to regulatory compliance. It is important to remember that the federal regulations establish a compliance baseline. Many states expand both the scope and depth of the federal regulations.

For each state, supplemental state-specific questionnaires are placed at the end of the federal questionnaire. The state-specific questionnaires deal only with exceptions to the federal requirements. Exceptions constitute those areas where the state requirements are more stringent or simply address areas unaddressed on a federal level.

All auditors should first work through the federal questionnaire completely. The auditor should then complete the appropriate state questionnaire.

_____ AUDIT PROGRAM - DRINKING WATER

TOUR CHECKLIST

- _____ Drinking water for the plant supplied from on-site source
- _____ Surface water (lake or stream)
- _____ Groundwater supply (well)
- _____ Additional treatment to municipal water supply required for drinking
- _____ Permanent work force at the facility greater than 25?
- _____ Samples taken at point(s) of entry of supplied water to the system
- _____ Analysis of organic, primary, and secondary drinking water standards performed

AUDIT PROGRAM - DRINKING WATER

Facility: _____

Auditor: _____

Date: _____

COMMENTS

QUESTION #	QUESTION	ANSWER
1	Does the facility monitor for the constituents listed in Table 1? (141.11)	Y N NA DK
2	Are the analytical levels below those identified in Table 1?	Y N NA DK
3	Refer to Table 2. Does the facility sample for total coliforms at the indicated frequency? (141.21) NOTE: The State may reduce the monitoring frequency to less than that shown in Table 2, but in no case can it be less than once per quarter.	Y N NA DK
4	If groundwater is used, are samples taken at each entry point to the distribution system? (141.23(a)(1))	Y N NA DK
5	If surface water is used, are samples taken after any treatment? (141.23(a)(2))	Y N NA DK

All citations refer to 40 CFR 141

AUDIT PROGRAM - DRINKING WATER

COMMENTS

ANSWER

QUESTION

QUESTION #

Y	N	NA	DK
---	---	----	----

If a combination of sources are used, are samples representative of all sources being used? (141.23(a)(3))

6

Y	N	NA	DK
---	---	----	----

Unless a waiver is applied for from the State, each facility must analyze drinking water originated at that source for all constituents listed in Table 3 for at least four quarters by December 31, 1995. Is a plan in place to assess these organic constituents in the water supply? (141.40(n)(1))

7

Y	N	NA	DK
---	---	----	----

Do organic analyses on record at the facility include the constituents in Tables 4 and 5? (141.61(a),(c))

8

Y	N	NA	DK
---	---	----	----

Are analyte concentrations listed in Tables 4 and 5 below listed levels? (141.61(a)(c))

9

Y	N	NA	DK
---	---	----	----

Does the facility analyze for secondary drinking water standards as listed in Table 6? (143.3)

10

Y	N	NA	DK
---	---	----	----

Are the analyte concentrations listed in Table 6 below listed levels? (143.3)

11

All citations refer to 40 CFR 141

QUESTION #

12

QUESTION

Does the facility maintain original records of the sampling data and analyses, reports, surveys, letters, evaluations, schedules, and State determinations made of their drinking water on the premises? (141.33)

ANSWER

Y	N	NA	DK
---	---	----	----

COMMENTS

All citations refer to 40 CFR 141

TABLE 1	
Contaminant	Concentration (mg/l)
Arsenic	0.05
Barium	1.0
Cadmium	0.01
Chromium	0.05
Lead	0.05
Mercury	0.002
Nitrate	10.0
Selenium	0.01
Asbestos	7 MFL

TABLE 2		
Population Served	Minimum Number of Samples per Month	
25-1,000	1	
1,001-2,500	2	
2,501-3,300	3	
3,301-4,100	4	
4,101-4,900	5	
4,901-5,800	6	
5,801-6,700	7	
6,701-7,600	8	
7,601-8,500	9	
8,501-12,900	10	
12,901-17,200	15	

TABLE 3	
Aldrin	
Benzo(a)pyrene	
Butachlor	
Carbaryl	
Dalspon	
Di(2-ethylhexyl)adipate	
Di(2-ethylhexyl)phthalates	
Dicamba	
Dinoseb	
Diquat	
Endothall	
Glyphosate	
Hexachlorobenzene	
Hexachlorocyclopentadiene	
3-Hydroxycarbofuran methomyl	
metolachlor	
Metribuzin	
Oxamyl (vydate)	
Picloram	
Propachlor	
Simazine	
2,3,7,8-TCDD (Dioxin)	

AUDIT PROGRAM-DRINKING WATER

TABLE 4

	0.002 mg/l
Vinyl chloride	0.005 mg/l
Benzene	0.005 mg/l
Carbon tetrachloride	0.005 mg/l
1,2-Dichloroethane	0.005 mg/l
Trichloroethylene	0.005 mg/l
para-Dichlorobenzene	0.075 mg/l
1,1-Dichloroethylene	0.007 mg/l
1,1,1-Trichloroethane	0.2 mg/l
cis-1,2-Dichloropropane	0.005 mg/l
Ethylbenzene	0.7 mg/l
Monochlorobenzene	0.6 mg/l
o-Dichlorobenzene	0.6 mg/l
Styrene	0.1 mg/l
Tetrachloroethylene	0.005 mg/l
Toluene	1.0 mg/l
trans-1,2-Dichloroethylene	0.1 mg/l
Xylenes (total)	10.0 mg/l

TABLE 5

	0.002 mg/l
Alachlor	0.003 mg/l
Aldicarb	0.004 mg/l
Aldicarb sulfoxide	0.003 mg/l
Aldicarb sulfone	0.003 mg/l
Atrazine	0.04 mg/l
Carbofuran	0.002 mg/l
Chlordane	0.0002 mg/l
Dibromochloropropane	0.07 mg/l
2,4-D	0.00005mg/l
Ethylene dibromide	0.0004 mg/l
Heptachlor	0.0002 mg/l
Heptachlor epoxide	0.0002 mg/l
Lindane	0.04 mg/l
Methoxychlor	0.0005 mg/l
Polychlorinated Biphenyls (PCBs)	0.001 mg/l
Pentachlorophenol	0.003 mg/l
Toxaphene	0.05 mg/l
2,4,5-TP	

All citations refer to 40 CFR 141

AUDIT PROGRAM-DRINKING WATER

TABLE 6	
Aluminum	0.05-0.2 mg/l
Chloride	250 mg/l
Color	15 color units
Copper	1.0 mg/l
Corrosivity	Non-corrosive
Fluoride	2.0 mg/l
Foaming Agents	0.5 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Odor	3 Odor Units
pH	6.5-8.5
Silver	0.1 mg/l
Sulfate	250 mg/l
Total dissolved solids	500 mg/l
Zinc	5 mg/l

Appendix C

AUDIT TEAM PERSONNEL RESUMES

RAYMOND KANE, P.E.
East Coast Regional Director

Education

M.S. Civil Engineering, Villanova University
B.S. Civil Engineering, Villanova University

Registration

Registered Professional Engineer, Pennsylvania

Experience Summary

Mr. Kane is a leading national expert in the field of environmental compliance management, auditing and program development. He is a principal author in the widely used text Environmental Audits, 6th Edition. He is a frequent lecturer and trainer for industrial companies, having trained over 1,000 people in the United States and Europe on a variety of environmental management topics. He has developed environmental audit and compliance management programs for the National Institute of Health, the U.S. Air Force, and several Fortune 500 companies. He has also managed and directed hundreds of environmental due diligence assessments for numerous financial institutions for property transactions.

Key Projects

Key project responsibilities for Mr. Kane have included:

- Project Manager for numerous environmental risk assessments for leverage buyouts and acquisition/divestiture transactions for financial lending institutions. Clients have included Chemical Bank, Citicorp Industrial Credit Corporation and First Union National Bank. Assisted several law firms as technical consultant in litigation of environmental cases.
- Project Director of worldwide environmental audit program for Johnson & Johnson; responsible for audits of facilities in 20 countries in Europe, South America and the Far East.
- Project Director of Chemical Bank's leverage buyout financing for large restaurant chain. Established program and managed assessments of over 200 facilities in 22 states. Completed project within 60 days and helped lender establish properties in collateral pool. Reviewed properties for hazardous waste, PCBs, wastewater, radon, asbestos and other potential risks.

Kane, Raymond

- Project Director for environmental assessment related to acquisition of Armstrong tire plants by Pirelli Tire Company of Milan, Italy. Developed assessment procedures, supervised field audits, edited assessment reports and participated in strategic meetings with Pirelli relative to risks and liabilities associated with acquisition of Armstrong facilities.
- Project Manager for an underground tank management plan for the Philadelphia Naval Shipyard. Conducted survey and risk assessment of 30 underground tanks, including projections of leak potential. Developed capital plan to manage the tank system, including retrofit, maintenance, replacement and tank testing.
- Project Manager for environmental audit and regulatory compliance review of Occidental Petroleum Corporation. Conducted reviews of over 100 chemical, petroleum and coal preparation facilities. Determined true costs of environmental compliance activities and corporate liability for three-year period in response to an SEC consent agreement. As a follow-up, also developed an Assessment Program Guidance Document (APGD) to help corporate staff set up programs, policies and procedures to ensure environmentally related liabilities and exposures are minimized.
- Developed agency-wide Environmental Audit Program for the National Institute of Health (NIH). Prepared a tailored audit manual, including protocols to audit multi-media compliance areas. Also developed environmental management procedures manual for NIH staff.
- Developed five environmental management guidance documents for the National Air Transportation Association. Topics included: (1) Hazardous Waste Management, (2) Oil Spill Control, (3) Underground Tank Management, (4) Wastewater Discharges, and (5) Hazardous Materials Management.
- Developed comprehensive Environmental Audit Program for U.S. Air Force. Audited over 25 Air Force installations and prepared an audit manual to be used by installations worldwide.
- Project Manager for groundwater remediation program for pesticide contaminated site for large chemical company in California. Responsible for operation and maintenance of carbon adsorption treatment facility, recovery wells, and injection wells. Also responsible for analytical lab and processing of sample from wells and treatment facility plant. Effluent treatment was required to be no greater than 1ppb. Project was part of consent agreement between EPA, state, and large chemical company.

RAY K. FORRESTER
Vice President/Managing Principal
Regional Director, Central U.S. Region

Education

B.S. Chemical Engineering, University of Missouri, Rolla, Missouri

Professional Experience

Mr. Forrester is Vice President, Managing Principal Engineer and Regional Director for McLaren/Hart's Central U.S. operations. Mr. Forrester has over 20 years of chemical and environmental engineering experience. His extensive experience includes expertise in hazardous waste site remediation; treatment technologies (especially thermal treatment alternatives) "innovative" treatment technologies; negotiations with all levels of the Environmental Protection Agency (EPA), Department of Justice (DOJ), and State, County, and local regulatory agencies; litigation support and technical liaison with Toxic Tort and governmental litigation; expert testimony; fiscal management of environmental liabilities; community, special interest group and media interface; risk based major hazardous waste site investigation; major project management and administration; regulatory compliance; chemical and pharmaceutical process and project engineering; and financial budgeting and tracking procedures.

Mr. Forrester's chemical engineering experience includes: management of project and process engineering of a two-site chemical and pharmaceutical manufacturing division; overall management of multi-million dollar capital construction budgets; design, construction, and operation of industrial wastewater treatment systems, air pollution abatement systems; waste minimization and recycling process modifications; energy recovery programs; and insurance, OSHA, FDA, Good Manufacturing Practices, and other non-environmental regulatory compliance. Mr. Forrester also has extensive experience in participation with industrial, professional, and governmental committees and boards. Selected experience descriptions include:

- Experienced in all phases of hazardous waste site investigations including: sampling, shipping, chain-of-custody documentation, analyses, environmental monitoring, worker health and safety, personal protective equipment, industrial hygiene, site remediation, waste storage, groundwater investigation, waste transport, ultimate disposal technologies, governmental regulatory compliance, governmental negotiations, and liaison with legal representation at a number of CERCLA, RCRA and state-lead sites.
- Worked on over 20 Superfund sites in investigation, remediation, negotiation, public affairs and litigation support.

RAY K. FORRESTER

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- Provided the Hardage superfund site PRP committee with expert counsel on specialty chemical remediation and treatment methods.
- Provided counsel at Brio and Dixie Oil Processor Superfund sites with expert advice on review of past RI/FS activities, appropriateness of remedy selection, technology selection and coordinated with other expert witnesses. These activities led to successful settlement of the pending litigation.
- Heading remediation and cost recovery activities at six glass manufacturing facilities across the country. Problems include documentation of sellers practices, remediation of solvent and lead contaminated soil and water, negotiation with the various agencies, and cost recovery.
- Provided counsel for the United Creosoting Company (UCC) Superfund site with expert counsel and testimony regarding the selected remedy, ROD and other alternative remediation and treatment methods. This technical support led to successful settlement of pending litigation.
- Provided indepth review of remedy selection process, detailed analysis of the Critical Fluids Extraction technology and made alternative recommendations for the remedy at the UCC site.
- Solely responsible for the design, and headed the implementation of the clean up of the first TCDD contaminated, drum burial site in the country. This Superfund site, located in Southwest Missouri, pioneered worker protective equipment designed to improve comfort and productivity and was completely excavated in less than three months. The project was termed by EPA's Douglas Costell as a "model for the nation" and won the first Missouri Department of Natural Resources' "Resource Stewardship Award". This site contained levels of TCDD over 2000 parts per million.
- Headed the technical negotiations of a multi-site hazardous waste problem for a major PRP. This negotiation was conducted at the Regional Administration level; senior EPA Headquarters and DOJ level; and senior state attorney general and department of resources level. Negotiations were extremely successful in dramatically reducing the PRP's potential liability by at least \$100M dollars.
- Served on the Missouri Dioxin Research Committee which aided in the selection and evaluation of various dioxin related research funded by the State of Missouri and private means.

- Appointed by Governor Bond as a member of the 10 person, Missouri Dioxin Task Force. Played a key role in the evaluation of approximately 40 dioxin contaminated sites and the development of a preliminary and final report to guide the Governor and MDNR in their approach to solving these problems. Evaluation included the Times Beach, Missouri dioxin contaminated site.
- Provided final peer review to the recent 1991 Congressional Office of Technology Assessment's "Background Paper-Dioxin Treatment Technologies".
- Overall project management of the preparation of an incineration workplan for a centralized hazardous waste incinerator facility designed to receive wastes from multiple locations. The entire workplan was completed in eight weeks.
- Principal in charge of treatment and remediation technologies selection for a major pharmaceutical company.
- Successfully negotiated three thermal treatment agreements with EPA to treat dioxin bearing waste streams using the EPA's Mobile Incinerator System (MIS).
- Heading investigation of a large, multifaceted chemical facility in Chicago, Illinois. Negotiations include both Region V EPA and Illinois EPA. Activities include redesign of plants wastewater treatment systems, operational process review and cost recovery litigation support.
- Heading the negotiation, investigation and interim measures at a mixed waste contaminated landfill in Region VII.
- Provided counsel and management of major Region VII Superfund site senior strategy advice and fiscal management assistance to allow implementation of the RD/RA in the most cost effective manner with best cash flow for the company.
- Provided technical assistance and third party oversight to EPA's dioxin trial burns using the MIS.
- Provided principal third party oversight to the operation of EPA's MIS while processing dioxin contaminated materials in Southwest Missouri.
- Advised EPA in efficiency and operational improvements to the EPA's MIS which increased throughput and reduced down time.
- Successfully negotiated delisting parameters for two separate hazardous waste streams containing dioxin, conducted scoping and delisting burns of these wastes,

and obtained "up front" delisting, thus eliminating future analysis of the treated residues.

- Served as member of a corporate incineration committee evaluating incineration options, waste streams characterization, site selection, permitting evaluation, and economic evaluation.
- Served on a joint industry, state, and EPA task force formed to evaluate treatment technologies, treatment costs and implementability (special emphasis on thermal treatment options). Headed the industry delegation of this task force.
- Served on a joint industry, state, and EPA taskforce formed to evaluate innovative remediation methods, remediation costs and cleanup designs (special emphasis on cost effective remedial designs). Headed the industry delegation of this taskforce.
- Performed a comprehensive evaluation of transportable thermal treatment systems, thermal treatment costs and companies providing these services for a major U.S. corporation. This evaluation included evaluation of European systems and their approach to thermal treatment.
- Served as corporate contact for environmental related concerns to communities, special interest groups, and news media representatives. Successfully reversed very negative public and media opinion regarding a pharmaceutical company's handling of a volatile and politically sensitive environmental problem.
- Assisted an East St. Louis, Illinois chemical plant with negotiation of RCRA investigations of their facility with Illinois EPA.
- Successfully negotiated an impasse between a major industrial facility in Nebraska and Region VII EPA over jurisdiction and credit for past work performed.
- Heading third-party oversight for the buyer of a large manufacturing facility in Kansas. Successfully prevented site from being listed as a Superfund site in Region VII.
- Provided the lead technical representation to numerous, successful negotiations with the EPA, DOJ and several state regulatory agencies regarding a variety of environmental problems at both RCRA and CERCLA sites. Extensive negotiating experience with the EPA Region VII Regional Administrator, senior and technical staff.

- Successfully intervened in faltering negotiation with the Colorado Department of Health to gain agreement on a remediation program for a single Potentially Responsible Party (PRP) hazardous waste site. This expedited negotiation allowed the PRP to remediate the site and send the waste to a landfill prior to the "Land Ban" thus saving over \$20M in unnecessary incineration costs.
- Advised a single PRP's project team in the development of a "crashed, critical path" plan to remediate a major hazardous waste landfill before the "Land Ban" became effective saving over \$20M in unnecessary incineration costs.
- Supervised the implementation of a novel, ultra violet (UV) photolytic degradation process for the destruction of 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD) bearing still bottom residues. This was the first in-situ destruction of over 13 pounds of TCDD contaminated waste.
- Implemented an innovative wastewater treatment system for TCDD and organics removal. Treated water met drinking water standards and TCDD removal to less than one part per trillion.
- Headed the investigation of a multi-phase groundwater contamination problem in the karst geology of Southwest Missouri and successfully negotiated a 3008 A and H order for this RCRA facility which provided a phased investigation and remedial design. Contaminants of concern included TCDD, methylene chloride, toluene, xylene, and dissolved brominated organics.
- Represented a major pharmaceutical company in ROD public hearings, to community special interest committees, public officials and to radio, television, and newspaper media representatives.
- Headed the technical liaison portion of the successful defense of a multi-billion dollar Toxic Tort litigation and served as the companies representative to the nine month test case trial. Testified on several key technical points in the case and designed an innovative exhibit and demonstration which proved a major technical point of the case.
- Headed the remediation of an unlined wastewater lagoon containing organic sludges, large quantities of solvents, and dioxin. The impoundment was dewatered, excavated, sludge stabilized and safely stored in less than two months. The former lagoon was closed under RCRA, capped and returned to productive use as a maintenance yard.
- Provided consultation and agency negotiation support to a major chemical company in the cost effective remediation of a closed, TCDD contaminated

surface impoundment and drainage area. This site was a CERCLA NPL site in Region VII of EPA.

- Provided senior negotiation support and counsel regarding environmental concerns to a major rubber company during the sale of their company to a Japan company.
- Provided senior advice to management to successfully negotiate a major air permit for a rubber company in Virginia. Also, provided public hearing support and media support to sell the permit to the community.
- Advised a major law firm in environmental concerns at a large waste landfill on the east coast and a PCB contaminated site in the northeast.
- Provided senior project management to three ECRA closures of industrial facilities in New Jersey.
- Responded to a wastewater chromium contamination problem at a major pharmaceutical facility. Rapid response prevented shutdown at the plant and returned the entire treatment system to operation in a matter of weeks. All discharge limits were met during the entire cleanup.
- Provided senior level, third party oversight and negotiation support at a major Superfund site containing pesticides, solvents and dioxins in the state of Utah. Successfully assisted corporate and outside counsel with review and negotiation of Feasibility Study documents, a 20 part per billion (ppb) dioxin clean up criteria. Successfully assisted client with final remedy selection and final negotiation of the ROD.
- Provided definitive review of innovated technologies applicable to dioxins, pesticides, herbicides and solvents in soil for a Region VIII Superfund site. This review included two feasibility tests involving solvent extraction with chemical treatment and in-situ vitrification (ISV). Guided counsel to selection of the ISV technology.
- Guided a major energy company in determining course of action in dealing with the discovery of dioxin contamination in several of its former production buildings. Made recommendations which allowed the issue to be handled effectively and without public or media attention.
- Provided a major energy and chemical manufacturer with third party advice concerning the decontamination, demolition, and segregation and containment of dioxin contaminated structures and equipment in New Jersey.

- Lead a group evaluating innovative technologies to treat drummed waste and soils containing dioxins at an abandoned chemical facility in New Jersey.
- Evaluated innovative technologies for a wood treating site in Region VI which contains pentachlorophenol and dioxins. Additionally, provided advice to counsel, negotiation, and presentation support to assure that the most appropriate remedy was selected.
- Numerous environmental audits have been performed for a major law firm whose clients are evaluating acquisition of new business sectors. These audits assess both environmental liability and the economics with possible "remediation related" discounts to the sales price.
- Managed over two hundred major capital construction projects (both process and environmental) for a major U.S. pharmaceutical company. ...
- Developed a wastewater reduction program for a major chemical plant which produced an 80 percent reduction in wastewater flow and recovery of significant quantities of lost product.

PROFESSIONAL ORGANIZATIONS

American Institute of Chemical Engineers
Tau Beta Pi, Engineering Honor Society
Missouri Waste Control Coalition, Member Resolutions Committee
Hazardous Materials Control Research Institute
National Water Well Association
Water Pollution Control Federation
American Institute of Chemists
American Chemical Society
Missouri Dioxin Research Committee
Missouri Governor's Dioxin Task Force

WILLIAM B. LINDSEY, P.E.
Supervising Engineer

Education and Registration

M.S. Civil Engineering, University of Missouri at Columbia
B.S. Civil Engineering, University of Missouri at Columbia

Registered Professional Engineer, Missouri No. 20562

Professional Experience

Mr. Lindsey's professional experience includes preparation of engineering reports and construction documents for hazardous waste remediation and general civil projects, facility assessments and compliance audits. He has served as project manager for hazardous waste feasibility studies, field investigations, remedial action designs, and general civil engineering design. His extensive work experience, in preparing feasibility studies, includes assimilation and interpretation of site characterization data and historic information, preparation of conceptual design alternatives based on this information, and economic evaluation of capital and operation/maintenance costs. Mr. Lindsey has been involved with several major facilities assessments and audits which involved obtaining, reviewing, and interpreting critical historical site specific information. Selected project experience includes:

- Project Manager for upgrade of a landfill closure for an existing municipal landfill located on an industrial facilities property. Work included preparation of conceptual upgrade options, and detailed drawings and specifications for a new cap system and surface drainage improvements. Work also included preparation of an individual storm water permit application including identification of facility storm drainage facilities and coordination of sampling efforts.
- Project Engineer for design of a groundwater interceptor trench to reduce contamination of an adjacent river from brine storage lagoons.
- Project Manager for facility audits for the Waste Site Inspection Group (WSIG), a consortium of Fortune 50 companies. The audits evaluate RCRA permitted Treatment, Storage, and Disposal (TSD) facilities for compliance with existing permit requirements and all federal, state, and local environmental regulations which govern operation of these facilities. Facilities audited include fuel blending energy recovery cement kilns, a hazardous waste incinerator, and a medical waste incinerator.

- Prepared a technology review of innovative technologies for the treatment of dioxin contaminated soils. The review included examining the Galson APEG-Plus dechlorination and the Geosafe Corporation in-situ vitrification technologies. The evaluation enabled a recommendation to be made to the client as to which technology was the most feasible.
- Participated in site sampling at a plant site formerly used as a packaging site for persistent dioxin-containing compounds to allow development of a cost estimate for decontamination and remediation of contaminated building materials and to evaluate a findings of a health risk assessment prepared by another consultant. Work included development of sampling protocols for several types of media in the plant. Sampling methods included wipe, chip, bulk dust, sediment and ambient air.
- Project manager for a major assessment of environmental liabilities at 17 pulp and paper mills on an expedited time schedule. Assessments included a review of environmental compliance of all areas of pollution control including dioxin contaminated wastewater discharges. Coordinated mill visits, preparation of mill reports, interviews with regulatory agencies, and preparation of the overall summary report. Extensive research was performed to gather background information about each mill's compliance history. Federal and respective state agencies were contacted to investigate each mill's existing compliance status and future regulations which may impact the mills. Costs estimates of each mill's liabilities were prepared and presented in a comprehensive report which summarized all information in an organized and clear fashion. The draft report was prepared in less than four weeks from the time of the mill visits.
- Project manager for closure of an existing landfill and permitting of a new demolition landfill for a refractory brick and materials manufacturer in Missouri. Work included preparation of the landfill closure plan and all applicable permit applications for the new landfill, a special waste permit, an NPDES permit, and a Army Corps of Engineers wetlands fill permit. Remediation of oil contaminated soil caused from leakage of above ground oil storage was also performed which included an initial site assessment, preparation of a remediation plan, verification samples, and assistance with disposal options.
- Performed numerous property transfer environmental assessments, including several light industries, retail establishments, and bank properties.
- Project engineer for an environmental assessment and background research of 100 railroad properties in six states on a very tight schedule. Assessments included an extensive file search, procurement of background information such

as NPL, CERCLIS, and leaking tank lists, and contacts with state regulatory agencies concerning air, water, solid and hazardous waste. Prepared reports which summarized historical information and results from the file searches and contacts with regulatory agencies.

- Project manager for preparation of construction drawings and specifications for relocation of mine tailing ponds, near Salt Lake City, Utah, for the Bureau of Reclamation. The tailings contained high levels of metals and would be a source of contamination for a lake, created from a new Bureau dam to supply drinking water. Responsible for review and evaluation of previous conceptual designs and test results and review of existing regulatory design requirements. Made recommendations for modified conceptual design and construction logistics, to comply with regulations and be cost effective.
- Project manager for a feasibility study and other related studies for a National Priorities List (NPL) site in Missouri. Responsible for interpreting information from the remedial investigation, which characterized contamination at the site. Site characterization data and research of applicable regulations, were used to prepare conceptual remedial design alternatives. Following USEPA feasibility study guidance, an economic and environmental evaluation of the conceptual designs was performed and the most feasible alternative was recommended. Evaluated feasibility of conveyance and treatment of the TCE contaminated groundwater by the local municipal sewer system and POTW. Supervised preparation of a sewer user rate study, resulting in negotiations with the local authority to reduce user charges.
- Project engineer for operable unit feasibility study at the Findett/HBRGW NPL site near St. Charles, Missouri. Responsible for interpretation of historical background information and site characterization data and development and evaluation of remedial design alternatives. Report was completed on an expedited basis in less than eight weeks. Site contamination principally involved volatile organic contamination in the groundwater.
- Project engineer for the Dutchtown Oil Treatment NPL site engineering evaluation/cost analysis (EE/CA) report, which was completed on an expedited basis. Responsible for organization and execution of on-site sampling of several large waste oil lagoons, to characterize contamination substances and levels. Responsible for preparation of the EE/CA report, which is a USEPA format, for an abbreviated feasibility study and included a summary of site history, and development and analysis of conceptual remedial alternatives. This site was an abandoned waste oil reclamation plant.

WILLIAM B. LINDSEY, P.E.

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- Project engineer for the Ruston/Vashon Island NPL site EE/CA report, located in Tacoma, Washington. At the site, the Asarco smelter had contaminated soil in the area with arsenic and other heavy metals.
- Project engineer for the Florence Land Recontouring Landfill NPL site in Florence, New Jersey. Responsible for development and evaluation of remedial design alternatives based on interpretation of site characterization and background data.
- Field investigation experience at the following sites: Oak Ridge, TN DOE facility; Dutchtown, LA NPL site; Florence, NJ NPL site; Bayou Bonfouca NPL site in Slidell, LA; Industrial Waste Corporation (IWC) NPL site near Ft. Smith, AR; TWA overhaul facility in Kansas City, MO; Allied (formerly Bendix) facility in Kansas City, MO; and the City of Englewood, CO. He is knowledgeable in sampling procedures, health and safety plans and requirements, field and personal protective equipment, confined space entry and first aid/CPR.
- Involved with development of closure and post-closure plans for underground storage tanks and piping for the IBM facilities in East Fishkill, NY, including a review of all applicable federal and state regulations and development of plans that comply with the regulations.

Professional Affiliations

American Society of Civil Engineers
Water Environment Federation
National Society of Professional Engineers
Missouri Society of Professional Engineers
Air and Waste Management Association

RENA D. BASS
Associate Environmental Scientist

Education

B.S. Chemistry, Southwest Missouri State University

40 Hour Hazardous Waste Site Operations Training Course
Management and Supervisor Training
AHERA Certified Asbestos Inspector
AHERA Certified Asbestos Management Planner

Professional Experience

As a McLaren/Hart team member, Ms. Bass brings a background in chemistry and risk assessment. She has contributed significantly to a number of human health risk assessments, regulatory compliance auditing programs, and property transaction environmental assessments. She has expertise in the development and implementation of site safety and health plans and has been instrumental in a project to re-evaluate the cancer potency factor of benzene. Other project-related experience includes management of subcontractors and report preparation. Field task experience includes soil sampling for lithologic description and laboratory analysis, slug and pumping tests, surface water and groundwater sampling for laboratory analysis, supervision of drilling rig operations, and groundwater monitoring well design and construction. In addition, Ms. Bass has conducted sophisticated chemical analyses for an in-house laboratory. Selected project experience includes:

- Primary team member for regulatory compliance auditing of over 15 electrical power generating and transfer facilities. She conducted field visits to coal and oil electric power plants, service centers, substations, and public water supply facilities at which she evaluated field conditions, conducted personnel interviews, and researched facility files. Her particular areas of auditing expertise include spill prevention control and countermeasures, underground storage tanks, asbestos, PCB management, drinking water, hazardous materials, hazardous waste, waste oil, and worker-right-to-know. She has also audited facilities for air emissions, CERCLA releases, solid waste, NPDES permitting, wastewater discharges, stormwater, pesticides, wetlands, and community right-to-know.
- Member of three-person team auditing major wood product and machinery manufacturing plant. Ms. Bass had primary responsibility for the facility visit, file review, and assessment of asbestos, hazardous waste, hazardous materials, PCBs, SPCC, underground storage tank, and solid waste issues. She assisted in evaluation of air emissions, and was responsible for assimilation of all data, evaluation of all environmental areas, and report preparation for the project.

- Conducted Property Transaction Environmental Assessment (PTEA) of a grocery store in Southwest Missouri. Tasks included: evaluation of aerial photographs to determine historical property uses; evaluation of local, state and federal environmental and health agency records; site inspection; interview of personnel familiar with site history and operations; and preliminary inspection of the building for potential asbestos containing building materials.
- Asbestos Hazard Emergency Response Act (AHERA) certified asbestos building inspector and management planner. Ms. Bass is familiar with asbestos health effects and liabilities, inspection and bulk sampling of asbestos containing building materials (ACBMs), and qualified to assess and recommend Operation and Maintenance (O&M) plans.
- Project team member of a RCRA Facility Investigation (RFI) for a major pharmaceutical company in southwest Missouri. Tasks included: evaluation of aquifer test data using AQTESOLV; evaluation of chemical data; alternate field technician for aquifer tests and coring tasks; and assisted with report preparation.
- Health and Safety Manager, Springfield, Missouri and St. Louis, Missouri offices. Responsibilities include: development of Site Safety and Health Plans to be used during investigation activities for various worksites; coordination of all health and safety training and medical surveillance for the Springfield, Missouri and St. Louis, Missouri offices; implementation of all Health and Safety policies and programs; and on-going coordination of Health and Safety issues to the Springfield, Missouri office.
- Project team member for a state ordered soil and groundwater investigation involving solvents, petroleum hydrocarbons, PCBs and hexavalent chromium for an aerospace manufacturing firm in Texas. Tasks included: monitoring well drilling, construction, and development; sampling (soil and water) of the wells; performing slug tests on ten wells and analyzing aquifer data using AQTESOLV; evaluating chemical data; determining degree and extent of solvent contamination; presenting waste (soil and water) options to client; and assisting with report preparation for submittal to the Texas Water Commission.
- Team member on a project for the American Petroleum Institute to re-evaluate the cancer potency of benzene. This project involved a re-examination of benzene exposure experienced by the epidemiological cohort on which benzene potency is based, as well as a scientific examination of the different forms of leukemia.

- Performed detailed toxicological evaluations in compliance with U.S. and international regulations for a major U.S. chemical company.
- Evaluated in detail the toxicological and environmental aspects of a chlorofluorocarbon substitute for a major manufacturer.
- While attending Southwest Missouri State University, Ms. Bass conducted research on the following projects: effects of polynuclear aromatic hydrocarbon (PAH)-contaminated water on plant metabolism; enzyme activity in fruit flies as part of an ongoing project to evaluate the role of free radicals in the aging process; synthesis of a number of polyimides utilizing a novel method of interfacial polycondensation; correlation of new polyamide-imides structures with their chemical-physical properties to optimize performance in specific applications.

Selected Presentations/Publications

Paustenbach, D.J., Price, P.S., Ollison, W., Jernigan, J.D., Bass, R.D., Blank, C., and Peterson, H.D. A re-evaluation of benzene exposure for the pliofilm (rubberworker) cohort (1936-1976). *Journal of Toxicology and Environmental Health*, 36: 177-231, 1992.

Paustenbach, D.J., Jernigan, J.D., Bass, R.D., and Scott, P.K. A proposed approach to regulating contaminated soil: identify safe concentrations for seven of the most frequently encountered exposure scenarios. Submitted to *Regulatory Toxicology and Pharmacology*.

Mohite, S.S., Bass (Bradshaw), R.D. (1989). New polyimides from N,N'-dicarboethoxy-pyromellitic diimide via interfacial polycondensation. *American Chemical Society Regional Meeting*.

Mohite, S.S., Thompson, C.C., Thaemlitz, C.J., Bass (Bradshaw), R.D. (1989). Structure-property correlations of new polyamide-imides. *Missouri Academy of Science Annual Meeting*.

Bass (Bradshaw), R.D., Gordon, A.R. (1989). An evaluation of measurements of peroxidase and catalase in extracts of *drosophila melanogaster*. *Missouri Academy of Science Annual Meeting*.

Colvert, K., Bass (Bradshaw), R., Wilkerson, J. (1988). The contribution of microsomal enzyme activity to the metabolism of benzo(a)pyrene in alfalfa. *Missouri Academy of Science Annual Meeting*.

Professional Affiliations: American Chemical Society